

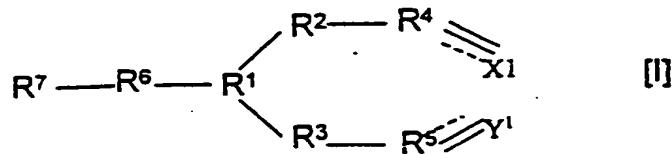
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Claims

1. A method of adhering or sealing surfaces, said method comprising applying to at least one surface, a compound of
5 formula (I)

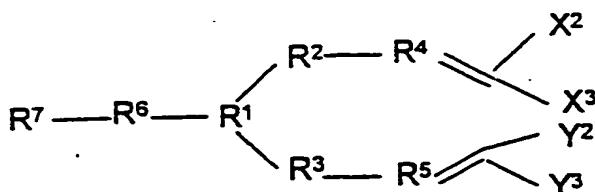


where R¹ is CH and R⁶ is a bond, or R¹ and R⁶ together form an
10 electron withdrawing group;
R² and R³ are independently selected from (CR⁸R⁹)_n, or a group
CR⁹R¹⁰, -(CR⁸R⁹CR⁹R¹⁰)- or -(CR⁹R¹⁰CR⁸R⁹)- where n is 0, 1 or 2, R⁸
and R⁹ are independently selected from hydrogen or alkyl, and
either one of R⁹ or R¹⁰ is hydrogen and the other is an electron
15 withdrawing group, or R⁹ and R¹⁰ together form an electron
withdrawing group,
R⁴ and R⁵ are independently selected from CH or CR¹¹ where R¹¹ is
an electron withdrawing group, and
R⁷ is hydrogen, an optionally substituted hydrocarbyl group, a
20 perhaloalkyl group or a functional group;
the dotted lines indicate the presence or absence of a bond, and
X¹ is a group CX²X³ where the dotted line bond to which it is
25 attached is absent and a group CX² where the dotted line bond to
which it is attached is present, Y¹ is a group CY²Y³ where the
dotted line bond to which it is attached is absent and a group
CY² where the dotted line bond to which it is attached is
30 present, and X², X³, Y² and Y³ are independently selected from
hydrogen and fluorine;
provided that at least one of (a) R¹ and R⁶ or (b) R² and R³ or
(c) R⁴ and R⁵ includes an electron withdrawing group;
and where necessary, a polymerisation initiator, allowing the
compound of formula (I) to polymerise in contact with a second
surface such that the said surfaces are adhered or sealed.

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2. A method according to claim 1 wherein the compound of formula (I) is a compound of formula (IA)



(IA)

5 where R^1 , R^2 , R^3 , R^4 , R^5 , R^6 , R^7 , X^2 , X^3 , Y^2 and Y^3 are as defined in claim 1.

10 3. A method according to claim 1 or claim 2 wherein the compound of formula (I) is polymerised under the influence of radiation or an electron beam, or by reaction with a chemical initiator.

15 4. A method according to claim 3 wherein the compound of formula (I) is polymerisable under the influence of ultra violet or thermal radiation.

20 5. A method according to claim 4 wherein the compound of formula (I) is curable under the influence of ultraviolet light.

6. A method according to claim 5 which comprises a polymerisation initiator which is a photoinitiator.

25 7. A method according to any one of the preceding claims wherein R^1 and R^6 form an electron withdrawing group.

8. A method according to claim 7 wherein in the compound of formula (I), R^2 and R^3 are groups $(CR^8'R^8)_n$ and R^4 and $30 R^5$ are CH groups.

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9. A method according to claim 7 or claim 8 wherein in the compound of formula (I), R¹ is a heteroatom or a substituted heteroatom which has electron withdrawing properties.

5 10. A method according to claim 9 where R¹ is a N⁺R¹²(Z^{m-})_{1/m}, S(O)_pR¹³, B or P(O)_qR¹⁴ where R¹², R¹³ and R¹⁴ are independently selected from hydrogen or hydrocarbyl, Z is a anion of valency m, p is 0, 1 or 2, and q is 0, 1, 2 or 3.

10 11. A method according to claim 10 where R¹ is a N⁺R¹²(Z^{m-})_{1/m} group where R¹², Z and m are as defined in claim 8.

12. A method according to claim 10 or claim 11 where Z is halogen.

15 13. A method according to claim 11 or claim 12 where R¹² is alkyl.

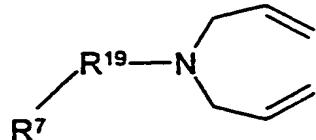
14. A method according to any one of claims 1 to 8 where R¹ is 20 a group CH and R⁶ is a group -C(O)O- or -OC(O)- or -S(O)₂-.

15. A method according to claim 14 where R¹ is a group CH and R⁶ is a group -C(O)O- or -OC(O)-

25 16. A method according to any one of claims 1 to 8 wherein R¹ is nitrogen, R⁶ is C(O), C(S) or S(O)₂.

17. A method according to claim 16 where the compound of formula (I) is a compound of structure (II)

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(II)

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where R⁷ is as defined in claim 1 and -R¹⁹- is C(O), C(S) or S(O)₂.

18. A method according to any one of claims 1 to 6 where R² and
5 R³ includes an electron withdrawing group.

19. A method according to claim 18 where at least one of R² or
R³ include electron withdrawing groups R⁹ and R¹⁰.

10 20. A method according to claim 19 wherein R⁹ and R¹⁰ together
form an oxo group.

21. A method according to any one of the preceding claims
wherein R⁷ comprises a hydrocarbyl group optionally substituted
15 by a functional group.

22. A method according to any one of the preceding claims
wherein R⁷ includes an unsaturated moiety.

20 23. A method according to claim 22 wherein the unsaturated
moiety is an aryl or alkenyl group, or a carbonyl substituent.

24. A method according to claim 21 wherein R⁷ is an optionally
substituted alkyl, alkenyl, alkynyl or aryl group.

25 25. A method according to claim 24 wherein R⁷ is substituted by
halogen, carboxy or salts thereof or acyloxy.

26. A method according to any one of claims 21 to 22 where R⁷ is
30 a perhaloalkyl group which comprises from 1 to 3 carbon atoms.

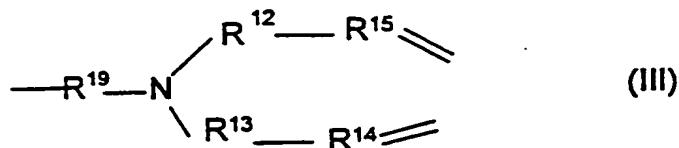
27. A method according to claim 26 where R⁷ is a perhalomethyl
group.

35 28. A method according to claim 21 where R⁷ is a dialkenyl
substituted amide.

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.29. A method according to claim 28 wherein the amide is of sub formula (III)

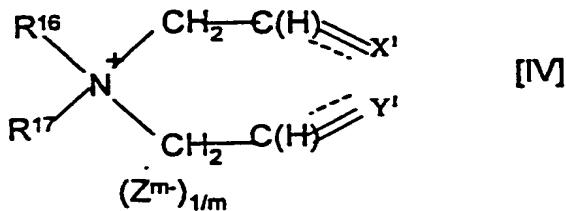


5 where R^{19} is as defined in claim 16, R^{12} and R^{13} are selected from groups defined above for R^2 and R^3 in relation to formula (I) and R^{14} and R^{15} are selected from groups defined above as R^3 and R^4 in relation to formula (I).

10 30. A method according to claim 29 where R^{12} and R^{13} are $-\text{CH}_2-$ or
 $-\text{CH}_2\text{CH}_2-$ groups and R^{14} and R^{15} are $-\text{CH}-$ groups.

31. A method according to any one of claims 1 to 3 wherein the compound of formula (I) is a compound of formula (IV)

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where X^1 , Y^1 , Z , m and the dotted lines are as defined in claim 2, the hydrogen atoms in bracket are absent when the dotted lines represent the presence of a bond, and R^{16} and R^{17} are independently selected from hydrogen and hydrocarbyl optionally substituted with hydroxy.

32. A method according to claim 31 wherein R^{16} and R^{17} are selected from alkyl, hydroxyalkyl and alkenyl.

25 33. A method according to claim 32 wherein R¹⁶ and R¹⁷ are prop-
2-enyl or hydroxyalkyl.

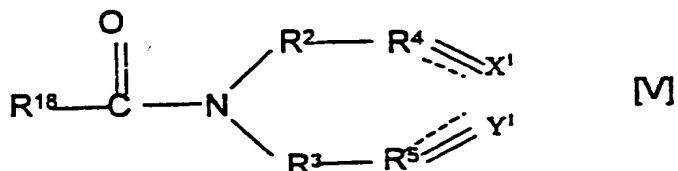
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34. A method according to claim 33 wherein hydroxyalkyl is a group of formula $-\text{C}((\text{CH}_2)_d\text{OH})_a(\text{H})_b$ where a is an integer of from 1 to 3 and b is 0 or an integer of 1 or 2 provided that $a+b$ is 3, and d is an integer of from 1 to 6.

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35. A compound of formula



where R^2 , R^3 , R^4 , R^5 , X^1 and Y^1 are as defined in claim 1 and R^{18} is an optionally substituted alkyl, alkenyl, alkynyl or aryl group provided that where R^2 and R^3 are both CH_2 and R^4 and R^5 are both CH , R^{18} is other than methyl, chloromethyl, trichloromethyl or trifluoromethyl.

15 36. The use of a compound of formula (I) as defined in claim 1 in an adhesive composition.

37. The use of a compound of formula (I) as defined in claim 1 in a sealant composition.

20 38. An article which includes at least two surfaces which are adhered together by means of a compound of formula (I) as defined in claim 1 which has been polymerised.

25 39. An article according to claim 38 wherein the surfaces comprise glass or metal surfaces or a mixture of these.

40. An article according to claim 38 or claim 39 wherein the polymerised compound of formula (I) provides an electrically 30 conducting layer.

41. A biomedical adhesive which comprises a biocompatible compound of formula (I) as defined in claim 1.

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42. The use of a compound of formula (I) as defined in claim 1
in a method according to any one of claims 1 to 34.